UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK

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NEW YORK STATE ASSEMBLY MEMBER MICAH Z. KELLNER, et al.,

Plaintiffs,

-against-

UNITED STATES ARMY CORPS OF ENGINEERS, et al.,

Defendants.

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DECLARATION OF HARVEY BRODSKY, P.E. IN OPPOSITION TO PLAINTIFFS' MOTION FOR SUMMARY JUDGMENT

12 CV 8458 (PAC)

RESIDENTS FOR SANE TRASH SOLUTIONS, INC., et al.,

Plaintiffs,

-against-

UNITED STATES ARMY CORPS OF ENGINEERS, et al.,

Defendants.

12 CV 8456 (PAC)

HARVEY A. BRODSKY, P.E. declares under penalty of perjury, pursuant to 28 U.S.C. § 1746, as follows:

1. I am employed by Greeley and Hansen, L.L.C., an environmental engineering firm specializing in water, wastewater and solid waste management. Greeley and Hansen provides services for all phases of projects ranging from master planning and feasibility studies through design, construction, and start-up, and also provides architectural and management consulting services. I received a Bachelor's Degree in Engineering (CIVIL) from the City College of New York in 1972 and I am a registered professional engineer currently

licensed in the States of New York, New Jersey, Illinois, Michigan, Pennsylvania and North Carolina. I have been employed by Greeley and Hansen since 1974, and I was promoted to the level of Associate in 1988 and Principal in 2009.

2. I have over 30 years of experience in the design and construction of large public works projects in the water, wastewater and solid waste sectors, having worked on projects in New York City, Philadelphia, Camden, and Boston. I am currently serving as Greeley and Hansen's Project Director for the New York City Department of Sanitation ("DSNY") Marine Transfer Station ("MTS") Conversion Program, a component of the New York City approved Comprehensive Solid Waste Management Plan ("SWMP"). I am also overseeing the design work for the additional flood protection measures selected for the East 91st Street MTS. I am aware of the claims made by Plaintiffs and am familiar with the facts and circumstances surrounding these claims by virtue of my role as Project Director. I make this affidavit based on personal knowledge, the books and records of Greeley and Hansen, DSNY and the New York City Department of Design and Construction ("DDC"), and conversations with Greeley and Hansen staff and employees of the City of New York.

3. I submit this declaration in opposition to Plaintiffs' motions for summary judgment and in further support of the City's motion for summary judgment. In particular, I wish to respond to claims made in the Declaration of Bruce Bell, dated September 16, 2013 ("Bell Declaration"), which sets forth certain criticisms of DSNY's May 2013 Technical Memorandum ("DSNY 2013 Technical Memorandum") regarding potential flooding impacts at the East 91st Street MTS site and additional design measures planned for the MTS.

Background

4. DSNY acted as lead agency under the New York State Environmental Quality Review Act ("SEQRA") for the environmental review of the SWMP. In that capacity, DSNY prepared the April 1, 2005 Final Environmental Impact Statement (FEIS) that analyzed the potential environmental impacts of the proposed East 91st Street MTS and of the SWMP as a whole. The SWMP was approved by the New York State Department of Environmental Conservation in October 2006.

5. DDC is managing the construction of the MTS on behalf of DSNY. DDC advertised the construction contract in January 2012, and bids were unsealed on June 28, 2012. Notice of the contract award was published in the City Register on September 26, 2012 and the contract was registered by the New York City Comptroller on December 12, 2012. In preparation for the contract's issuance, DSNY and DDC secured various permits necessary for the MTS's construction, including a building permit from the New York City Department of Buildings, which was issued on October 24, 2012.

6. On October 29, 2012, the east coast of the United States experienced the effects of Superstorm Sandy, which included high winds, large amounts of rain, and a damaging storm surge. The storm surge from Sandy, which occurred during high tide, caused extensive flooding in New York City, especially at waterfront locations such as the East 91st Street MTS site. Following the storm, the City asked Greeley and Hansen to prepare a study of the actual storm surge levels from Sandy with respect to all four of the MTS locations included in the SWMP. *See* DSNY 2013 Technical Memorandum, Attachment 1, "Superstorm Sandy: Storm Tide Flood Damage and Recommendations – Preliminary Report," Jan. 2013. The City also asked Greeley and Hansen to provide recommendations as to design modifications and other

measures that could further harden the East 91st Street MTS against disruptions from future coastal flooding, which were set forth in a conceptual design report. *See* DSNY 2013 Technical Memorandum, Attachment 2, "Flood Protection Conceptual Design Report," May 2013. DSNY adopted the design modifications recommended in the May 2013 Greeley and Hansen report, which involve perimeter floodproofing measures and additional dry floodproofing of certain rooms with critical equipment at the East 91st Street MTS. DSNY 2013 Technical Memorandum at 3.

7. In its capacity as lead agency, DSNY also considered whether there were any potentially significant environmental impacts expected to result from the design changes that were not already considered in the FEIS, and concluded that none of the modifications, individually or collectively, were reasonably foreseeable to result in a significant adverse impacts. DSNY 2013 Technical Memorandum at 4.

8. After these floodproofing measures were selected, the conceptual design was refined through a more detailed design process so that the selected measures could be incorporated into the MTS project's design documents. During the final design phase, detailed structural design criteria were developed. The final design phase of the floodproofing measures also included extensive computer modeling and analysis of the hydrodynamic forces that would act on the facility in the event of a severe storm. These design documents were finalized in late October 2013, at which time they were issued to the contractor for incorporation into the project contract.

The Bell Declaration

9. In his Declaration, Dr. Bell offers a number of opinions regarding the DSNY 2013 Technical Memorandum and its attachments. He states: (1) that the Memorandum

and its attachments are superficial and incomplete, in that they don't fully consider the flood risks and protection measures, and do not evaluate the possibility of abandoning or relocating the MTS; (2) that the flood protection measures selected do not "fully" protect the MTS, and there is an unknown risk of failure of the floodproofing measures; (3) that floodproofing the MTS would be complicated, and the Memorandum does not adequately analyze the time required to implement the selected measures; (4) that recommendations for protecting the Container Transport System are vague and inconsistent, and that the Memorandum fails to consider the City's ability to handle solid waste in the event that the MTS is out of service for an extended period due to a flood; and (5) that the Memorandum fails to consider various wave forces and the effects of climate change, and is based on interim Advisory Base Flood Elevations ("ABFEs") issued by FEMA, which are subject to change. Bell Declaration ¶ 8. As explained in more detail below, these criticisms are unfounded.

10. As a preliminary matter, the DSNY Memorandum was prepared to evaluate whether there were any potential environmental impacts associated with the design changes planned for the MTS and related new information on flood risks, including the ABFEs and emergency Department of Buildings regulations issued on January 31, 2013. *See* DSNY 2013 Technical Memorandum at 4. While Dr. Bell spends considerable time questioning DSNY's floodproofing design choices and analysis, he does not identify specific significant adverse impacts associated with the floodproofing measures that were not already addressed in the FEIS and the 2013 DSNY Technical Memorandum.

General Adequacy of the Technical Memorandum

11. Dr. Bell's opinion that the Technical Memorandum and its supporting documents are somehow superficial and incomplete is apparently based on an assumption that

the following options were either not considered or adopted: abandoning the current site; relocating the MTS to another site; and redesigning the MTS to be above the Advisory Base Flood Elevation (ABFE). *See* Bell Declaration ¶ 8(a). This opinion reflects a mere policy disagreement with DSNY's approach, and also ignores the advanced stage of the MTS project when Sandy occurred.

12. At the time Sandy passed through New York in late October 2012, the contract for the East 91st Street MTS's construction had already been noticed for award. The site had also been approved under the City's required Uniform Land Use Review Procedures for site selection, and had secured the necessary permits for construction and operation at the East 91st Street site. Indeed, because the facility was approved for its building permit on October 24, 2012, alterations to further protect the facility from flooding were not legally required under the City's building code since the facility was code compliant at the time of permitting. *See* DSNY 2013 Technical Memorandum at 3. However, the City made a policy determination that additional flood mitigation measures should be implemented at the MTS, and adopted the measures proposed in the Greeley and Hansen Flood Protection Conceptual Design Report dated May 2013. These measures will provide two layers of protection for critical equipment at the facility.

13. Dr. Bell suggests it was inappropriate for DSNY to rely on the ABFEs when preparing the 2013 Technical Memorandum, and that DSNY should have waited until FEMA publishes the final Base Flood Elevations. Bell Declaration ¶ 36. This suggestion is unfounded. The analyses included in the DSNY 2013 Technical Memorandum utilized the best information available at the time, including both the FEMA ABFEs issued in February 2013 and a detailed review of information available about conditions at the East 91st Street site during

Sandy. *See* DSNY 2013 Technical Memorandum at 2-4 & Attachment 1. The final FEMA maps may not be issued for some time, and it was reasonable to develop flood protection recommendations based on the available information. Indeed, FEMA released the Preliminary Flood Insurance Rate Maps (FIRMs) for New York City on December 5, 2013, beginning a public comment period, and the final maps are not expected to be issued until 2015.[1] It should also be noted that the additional design work conducted to refine the conceptual design, discussed in more detail below, utilized the updated Preliminary Work Maps issued by FEMA in June 2013, which were largely consistent with the ABFEs. In addition, the coastal flood hazard information in the Preliminary FIRMs for the East 91st Street MTS site is exactly the same as the information set forth in the Preliminary Work Maps. Dr. Bell offers no basis to conclude that the final maps will be so different from the ABFEs and the Preliminary Work Maps as to render the selected flood protection measures ineffective.

Effectiveness of the Selected Floodproofing Measures

14. Dr. Bell also criticizes the specific actions selected for floodproofing the MTS facility, *i.e.*, dry floodproofing of the MTS perimeter coupled with dry floodproofing of some, but not all, rooms with critical equipment. *See* Bell Declaration ¶¶ 8(b), 18-29. These actions were selected in order to mitigate damage from a potential flood event. They provide two levels of protection to critical rooms located on the Pier Level of the facility. DSNY has concluded that this level of floodproofing, along with other design and operational measures planned for the MTS, will provide a sufficient margin of protection from future severe weather events. While Dr. Bell might disagree with this conclusion, there is nothing in his Declaration to

[1] *See* NYC Special Initiative for Rebuilding and Resiliency, "FEMA Flood Map Update," at http://www.nyc.gov/html/sirr/html/map/flood_map_update.shtml (last visited Dec. 6, 2013).

suggest that the measures selected will not provide an appropriate level of safety in accordance with accepted engineering principles.

15. Dr. Bell makes much of the fact that the DSNY Memorandum states that the perimeter floodproofing measures selected for the MTS have a "moderate probability of failure," without defining or explaining what is meant by "moderate." *See* Bell Declaration ¶¶ 8(b), 28. Again, the intent of the selected measures is to mitigate potential damage from a flood event with two levels of protection to critical rooms located on the pier level of the facility, and the City has determined that this is an appropriate protective measure for the facility. These measures also satisfy the City's new building code requirements for non-residential buildings located in flood zones. *See* N.Y.C. Admin. Code § 27-317 (allowing floodproofing of the lowest floor up to the level of the applicable base flood elevation); R.C.N.Y. Title 1, Subchap. G, § 3606-04 (DOB emergency rule adopting new freeboard requirements). Secure storage of the floodproofing materials has been discussed with DSNY and sufficient room is provided within the MTS for these components.

16. Dr. Bell erroneously states that certain critical equipment, consisting of the sewage ejector/sump pumps and various process-critical equipment including the dust suppression equipment package, service water equipment package, odor control equipment package, oil-water separation tank and Container Transport System would not receive critical room dry floodproofing. Bell Declaration ¶¶ 23-24. In fact, dry flood proofing has been incorporated for these additional areas as part of the final design. Similarly, the vendor for the gantry cranes at the East 91st Street MTS had not been selected at the time Greeley and Hansen's May 2013 Conceptual Design Report was prepared, so detailed recommendations could not be made. However, the Report recognizes that measures would need to be employed to protect the

gantry cranes. *See* DSNY 2013 Technical Memorandum, Attachment 2 at 14. DSNY is working with the crane manufacturer as well as the service provider on options for flood protection.

17. Dr. Bell suggests that DSNY's rejection of raising the MTS Pier level was perfunctory. *See* Bell Declaration ¶¶ 8(a), 16, 43. As noted in the Flood Protection Conceptual Design Report, however, the height increase that would be required to raise the facility above the revised design flood elevation is 68 inches. DSNY 2013 Technical Memorandum, Attachment 2 at ES-1. The area around the entrance ramp that leads up to the MTS from York Avenue is constrained and does not permit the geometry of the entrance ramp to change substantially. The footprint of the MTS would need to be moved further out over the water to allow for the ramp to make up the difference in height. This drastic change results in a number of additional concerns including the need for additional permitting of the facility under state and federal law, environmental reviews, building permit approval, Public Design Commission approval, and additional land acquisition. Therefore, this option was not recommended for the East 91st Street MTS.

Effectiveness of Operational Measures

18. Dr. Bell is correct when he indicates that floodproofing the MTS in anticipation of an imminent and severe storm would be a complicated process. Bell Declaration ¶¶ 8(c), 30-35. Tellingly, however, Dr. Bell never suggests that the selected flood protection measures are infeasible. DSNY has stipulated that it will cease waste collections 48 hours prior to the forecast arrival of a potential flood event. Approximately 24 hours will be needed to process remaining waste in the station, leaving the remaining 24 hours available to set up flood protection. In addition, many of the protection measures which need to be deployed can be set up at pier level while processing of waste continues. DSNY routinely and regularly monitors

weather conditions and will develop protocols to cease collection operations well before conditions deteriorate. DSNY will also establish protocols to ensure that personnel will deploy the flood protection measures and will exit the pier level prior to the flood event. DSNY manages numerous facilities throughout the City in all weather conditions, and has the necessary experience and expertise to ensure that it can complete the necessary waste processing and floodproofing activities in advance of severe weather.

19. Next, Dr. Bell asserts that DSNY did not assess the risk that damage to the facility caused by a severe storm could force the MTS to cease operations for a prolonged period of time, which he states would "undermine the stated purposes of the SWMP," and that DSNY did not analyze the impacts of a potential shutdown. Bell Declaration ¶¶ 11, 38. This assertion ignores the redundancy built into the MTS and Long-Term Export Plan, a fundamental feature of the SWMP. Contrary to Dr. Bell's assertion, the solid waste management system which includes the four MTSs is intended to be robust, recognizing that it requires redundancy should one or more of the system's components fail. SWMP at ES-2 & 3-7. The DEC operating permits for each of the four MTSs allows DSNY to send additional waste for processing in the case of an emergency. *See, e.g.*, DEC Permit Special Condition 17, USACE 26-27. Thus, DSNY has the operational ability and permits in place to divert waste from an MTS facility that is out of operation.

Additional Design Work Since May 2013

20. A number of Dr. Bell's criticisms relate to various design parameters and other information that was not included in the DSNY 2013 Technical Memorandum. *See* Bell Declaration ¶¶ 36-38. As noted above, once DSNY approved the measures recommended in the conceptual design report (which are the subject of the DSNY Memorandum), the design

consultants proceeded to develop a detailed design of the floodproofing measures for inclusion in the contract documents. Many of the supposed gaps identified by Dr. Bell were addressed during the detailed design phase.

21. For example, during the final design phase of the floodproofing measures computer modeling was utilized to develop the hydrodynamic forces acting on the facility in the event of a severe storm. The project site is located near Hell Gate, at a turn in the East River where it meets the Harlem River. The shoreline has a complex shape in the area, making current and wave effects at the facility difficult to evaluate manually. For this reason, computer models were used to estimate current and wave parameters at the project site consistent with the 100-year FEMA design storm. The MIKE21 Hydrodynamic Module was used to simulate current effects and the MIKE21 Spectral Wave Module was used to simulate wave effects. The models include the entire Harlem River, and stretches of the East River and Hudson River in the vicinity of Manhattan, modeling the geometry of the shoreline and the varying water depths. In both models, the grid uses fine elements in the vicinity of the project, and coarser elements in more distant reaches. They measure the peak current and wave effects at numerous points around the periphery of the MTS platform.

22. The model was used to develop revised structural criteria for the project elements that could be exposed to flooding. Using the most up-to-date information available, including the Preliminary Work Maps issued by FEMA in June 2013 (which supersede the February 2013 ABFEs), these criteria specify values for Building Occupancy Category; Flood Zone Category; Base Flood Elevation; Design Flood Elevation; Limit of Moderate Wave Action; Base Stillwater Flood Elevation; Design Stillwater Flood Elevation; Flood Load Combinations; Design Flood Current Velocity; Design Wave Height; Debris Weight; and Debris Velocity.

These updated design criteria have been factored into the design documents for the project, and take into account imposed hydrodynamic forces. In addition, changes to the concrete mix design, waterstops and crack control criteria were also incorporated to improve watertightness for the project. The final design of the floodproofing measures also incorporated the necessary structural detailing based on the revised structural design criteria.

23. Finally, Dr. Bell also erroneously suggests that the design of the MTS and subsequent flood proofing modification do not consider the effects of climate change. Bell Declaration ¶¶ 39-42. The facility has been designed in accordance with the NYC Building Code, has been granted a permit to construct and has adopted flood protection measures that take into consideration the hydrodynamic forces anticipated during a severe storm event. These design features, along with the facility's original three-level design in which no loose waste is present on the lowest level, will make the facility resilient to the future impacts of climate change, including flooding.

24. I declare under penalty of perjury that the foregoing is true and correct. Executed on December 13, 2013.

HARVEY A. BRODSKY